CLAIM AMENDMENTS

Claim Amendment Summary

Claims pending

- Before this Amendment: Claims 1-20.
- After this Amendment: Claims 1-20 and 87-90

Non-Elected, Canceled, or Withdrawn claims: None

Amended claims: 1-20

New claims: 87-90

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended): One or more processor-accessible storage media comprising processor-executable instructions that, when executed, direct a first device to perform actions comprising:

accepting a connection at the first device;

receiving data at the first device as a result of accepting the connection;

aggregating a connection state for the connection ~~from a protocol stack~~ at the first device by aggregating a protocol state of a first protocol stack and the data to constitute a binary blob; and

sending the connection state for injection into a second protocol stack at a second device by sending the binary blob including the protocol state and the data to the second device, whereby the connection is transferred to the second device.

2. (Currently Amended): The one or more processor-accessible storage media as recited in claim 1, further comprising, prior to the aggregating,

determining the second device to receive migration of the connection state from among a plurality of second devices; and

passing a migrate connection function call to a topmost layer of the first protocol stack to initiate the aggregating of the connection state for migrating the connection state to the determined second device ~~wherein the action of accepting comprises an action of:~~

~~sending an acknowledgment packet in response to a connection-requesting packet~~.

3. (Currently Amended): The one or more processor-accessible storage media as recited in claim 1, wherein the action of sending the connection state comprises an action of:

sending the binary blob asynchronously to a connection migrator component at the second device, wherein the connection migrator component is configured to received the binary blob as a bundle, reassemble the connection state from the binary blob, and infuse the connection state into the second protocol stack at the second device~~comprising the processor-executable instructions that, when executed, direct the device to perform a further action comprising:~~

~~receiving data for the connection;~~

~~wherein the action of aggregating comprises an action of:~~

~~aggregating the connection state from a protocol state of the protocol stack and the data~~.

4. (Currently Amended): The one or more processor-accessible storage media as recited in claim 1, wherein the action of aggregating comprises an action of:

compiling ~~a~~ the protocol state from the first protocol stack for use in offloading the connection state as a binary blob, wherein the compiled protocol state includes destination and source ports and IP addresses.

5. (Currently Amended): The one or more processor-accessible storage media as recited in claim 4, wherein the action of compiling comprises an action of:

compiling the protocol state from the first protocol stack starting at a highest level of the first protocol stack, proceeding down the first protocol stack, to compile the protocol state, and then aggregating the received data with the compiled protocol state into the binary blob to be sent to the second device.

6. (Currently Amended): The one or more processor-accessible storage media as recited in claim 4, wherein the action of compiling comprises an action of:

compiling the protocol state from the first protocol stack at a transmission control protocol (TCP) stack portion and an internet protocol (IP) stack portion.

7. (Currently Amended): The one or more processor-accessible storage media as recited in claim 1, wherein the action of sending comprises actions of:

bundling the connection state with mapping for a flow identifier that corresponds to the connection to produce ~~a~~ the binary blob; and

transmitting the binary blob having the flow identifier mapping bundled therein from ~~an originating~~ the first device to ~~a target~~ the second device.

8. (Currently Amended): The one or more processor-accessible storage media as recited in claim 1, wherein the action of sending comprises an action ~~actions~~ of:

~~bundling the connection state with a flow identifier that corresponds to the connection to produce a binary blob; and~~

transmitting the binary blob from ~~an originating~~ the first device to ~~a target~~ the second device asynchronously in a reliable manner such that the binary blob ~~may be~~ is received intact at the ~~target~~ second device even if one or more packets that comprise the binary blob are lost or corrupted.

9. (Currently Amended): The one or more processor-accessible storage media as recited in claim 1, comprising the processor-executable instructions that, when executed, direct the first device to perform further actions comprising:

selecting a flow identifier for the connection responsive to a connection counter; and

sending mapping for the flow identifier to the second device for use by the second device in identifying a source of encapsulated packets received by the second device and corresponding to the connection.

10. (Currently Amended): The one or more processor-accessible storage media as recited in claim 1, ~~wherein the action of sending comprises an action of:~~

~~sending the connection state to a targeted device;~~ wherein the processor-executable instructions, when executed, direct the first device to perform a further action comprising:

forwarding subsequent packets for the connection to the ~~targeted~~ second device using a flow identifier to encapsulate the subsequent packets, said encapsulated subsequent packets including the flow identifier in source and destination port fields of a TCP header.

11. (Currently Amended): One or more processor-accessible storage media comprising processor-executable instructions that, when executed, direct a first device and a second device to perform actions comprising:

accepting a connection at the first device;

receiving data at the first device as a result of accepting the connection;

aggregating a connection state for the connection at the first device by aggregating a protocol state of a first protocol stack and the received data to constitute an aggregated connection state;

sending the aggregated connection state asynchronously from the first device to the second device;

receiving ~~a~~ the aggregated connection state ~~for a connection~~ asynchronously at the second device, whereby the aggregated connection state comprised of the protocol state and the received data is received intact at the second device;

injecting the aggregated connection state for the connection into a network stack at the second device; and

continuing the connection at the second device using the injected connection state.

12. (Currently Amended): The one or more processor-accessible storage media as recited in claim 11, wherein the action of continuing comprises an action of:

continuing the connection by indicating received packets up to an application in accordance with the injected connection state.

13. (Currently Amended): The one or more processor-accessible storage media as recited in claim 11, wherein:

the action of receiving comprises ~~an~~ actions of:

receiving the connection state as a binary blob asynchronously at the second device,

recognizing the binary blob as a blob for connection migration; and ~~connection state, the connection state having a protocol state and data for the connection; and~~

the action of injecting comprises an action of:

infusing the protocol state into a second protocol stack forming a portion of the network stack at the second device, and

directing data from the binary blob to an application at the second device as if the second device were part of a new locally terminated connection~~injecting the protocol state into a protocol stack portion of the network stack~~.

14. (Currently Amended): The one or more processor-accessible storage media as recited in claim ~~13~~ 11, wherein the action of injecting the connection state further comprises an action of:

indicating the data for the connection up the network stack toward an application.

15. (Currently Amended): The one or more processor-accessible storage media as recited in claim 11, wherein the action of injecting comprises an action of:

infusing ~~a~~ the protocol state from the connection state into a second protocol stack forming a portion of the network stack.

16. (Currently Amended): The one or more processor-accessible storage media as recited in claim 15, wherein the action of infusing comprises an action of:

infusing the protocol state into the second protocol stack starting at a highest level of the second protocol stack.

17. (Currently Amended): The one or more processor-accessible storage media as recited in claim 11 ~~15~~, wherein the action of ~~infusing~~ receiving comprises an action of:

receiving a binary blob from the first device at the second device, the binary blob including the aggregated connection state bundled with mapping for a flow identifier that corresponds to the connection~~infusing the protocol state~~

~~into the protocol stack at a transmission control protocol (TCP) stack portion and an internet protocol (IP) stack portion~~.

18. (Currently Amended): The one or more processor-accessible storage media as recited in claim ~~11~~ 17, wherein the action of receiving comprises actions of:

~~receiving a binary blob from an originating device at a target device, the binary blob including the connection state and a flow identifier that corresponds to the connection; and~~

unbundling the aggregated connection state and the mapping for the flow identifier at a level of the network stack that is below a second protocol stack portion of the network stack.

19. (Currently Amended): The one or more processor-accessible storage media as recited in claim 11, comprising the processor-executable instructions that, when executed, direct the second device to perform further actions comprising:

receiving an encapsulation mapping for a flow identifier at the second device from the first device; ~~and~~

storing the received encapsulation mapping in an encapsulation mapping table that may be accessed according to the flow identifier; and

receiving encapsulated packets at the second device from the first device, said encapsulated packets including the flow identifier in source and destination port fields of a TCP header.

20. (Currently Amended): The one or more processor-accessible storage media as recited in claim 11,

~~wherein the action of receiving comprises an action of:~~

~~receiving the connection state from an originating device;~~

~~wherein~~ the processor-executable instructions, when executed, direct the second device to perform a further action comprising:

receiving from the ~~originating~~ first device encapsulated packets that have a flow identifier in source and destination port fields of a TCP header; and

de-encapsulating the encapsulated packets using an encapsulation mapping entry that links the flow identifier to a source/destination pair.

21. - 86. (Canceled)

87. (New): One or more processor-accessible storage media comprising processor-executable instructions that, when executed, direct a first device and a second device to perform actions comprising:

accepting a connection at the first device by sending an acknowledgment packet to a requester in response to a connection-requesting packet;

receiving data for the connection at the first device from the requester;

determining, by the first device, the second device to which to migrate the connection from among a plurality of second devices, based upon the received data;

compiling a protocol state for the connection from a first protocol stack at the first device;

aggregating a connection state for the connection by aggregating the compiled protocol state and the received data to constitute a binary blob;

bundling a mapping for a flow identifier into the binary blob;

sending the connection state from the first device by asynchronously sending the binary blob to the second device;

receiving the connection state as the bundled binary blob at the second device;

unbundling the aggregated connection state and the mapping for the flow identifier at a level that is below a second protocol stack at the second device;

injecting the connection state by the connection migrator component into the second protocol stack at the second device; and

continuing the connection at the second device using the injected connection state.

88. (New): A method of carrying out load balancing, comprising:

accepting a connection at a first device;

receiving data at the first device as a result of accepting the connection;

aggregating a connection state for the connection at the first device by aggregating a protocol state of a first protocol stack and the data to constitute a binary blob; and

sending the connection state for injection into a second protocol stack at a second device by sending the binary blob including the protocol state and the data to the second device, whereby the connection is transferred to the second device.

89. (New): A method of carrying out load balancing, comprising:

accepting a connection at a first device;

receiving data at the first device as a result of accepting the connection;

aggregating a connection state for the connection at the first device by aggregating a protocol state of a first protocol stack and the received data to constitute an aggregated connection state;

sending the aggregated connection state asynchronously from the first device to a second device;

receiving the aggregated connection state asynchronously at the second device, whereby the aggregated connection state comprised of the protocol state and the received data is received intact at the second device;

injecting the aggregated connection state for the connection into a network stack at the second device; and

continuing the connection at the second device using the injected connection state..

90. (New): A method of carrying out load balancing, comprising:

accepting a connection at a first device by sending an acknowledgment packet to a requester in response to a connection-requesting packet;

receiving data for the connection at the first device from the requester;

determining, by the first device, a second device to which to migrate the connection from among a plurality of second devices, based upon the received data;

compiling a protocol state for the connection from a first protocol stack at the first device;

aggregating a connection state for the connection by aggregating the compiled protocol state and the received data to constitute a binary blob;

bundling a mapping for a flow identifier into the binary blob;

sending the connection state from the first device by asynchronously sending the binary blob to the second device;

receiving the connection state as the bundled binary blob at the second device;

unbundling the aggregated connection state and the mapping for the flow identifier at a level that is below a second protocol stack at the second device;

injecting the connection state by the connection migrator component into the second protocol stack at the second device; and

continuing the connection at the second device using the injected connection state.